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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/626,403

07/24/2003

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16791

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03/30/2005

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EXAMINER

DAVIS, OCTAVIA L

ART UNIT

PAPER NUMBER

2855

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/626,403	Applicant(s) ROWE ET AL.	
	Examiner Octavia Davis	Art Unit 2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 23-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 23-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1 – 18 in the reply filed on 10/4/04 is acknowledged.

Claims 19 – 22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement in the reply filed on 10/4/04.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 6, 8 – 11, 13 – 16, 23, 24, 30 and 31 are rejected under 102(b) as being anticipated by Soares.

Regarding claims 1 – 3, 5, 6 and 16 – 18, Soares discloses a Schottky-barrier semiconductor device comprising a semiconductor layer 105 and an adjacent metal shunt 110, 115 forming an interface 125 therebetween, wherein a strain induced at the interface changes a resistance at the interface and the interface 125 is located along a top side portion of the film 105 and along a bottom side portion of the shunts 110, 115 (See Cols. 7 and 8, lines 38 – 52 and 1 – 11).

Regarding claims 2 and 3, the induced strain comprises a tensile and a compressive strain (See Col. 7, lines 34 – 36).

Regarding claims 4 and 5, the interface comprises a resistive and a Schottky interface (See Col. 8, lines 1- 5).

Regarding claim 6, the semiconductor film comprises an n-type thin film with a thickness of approximately one to ten microns (See Cols. 6 and 7, lines 52 – 57 and 40 – 41).

Regarding claim 8, the metal shunt comprises gold (See Col. 7, lines 23 – 33).

Regarding claims 9 - 11, the semiconductor film 202 constitutes a substrate serving as a supporting structure (See Col. 7, lines 38 – 40).

Regarding claims 13 - 15, a processor 736 receives information on the measurement of current indicative of strain combined with temperature effects wherein the processor is capable of being programmed to provide an output indicative of the strain and (See Col. 12, lines 13 – 23) means 100 senses a change in resistance (See Cols. 7 and 8, lines 34 – 36 and 6 – 15).

Regarding claim 18, a change in the voltage is measured utilizing voltage measuring means 214 (See Cols. 7 and 8, lines 52 – 54 and 19 – 27).

Regarding claims 23 and 30, contacts 110, 115 are arranged on the film 105 (See Col. 6, lines 25 – 28).

Regarding claims 24 and 31, the contacts 110, 115 are situated on the film 105 on an opposite side of the interface 125 (See Fig. 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the

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subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 12, 17, 25, 26, 27 – 29 and 32 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soares in view of Hines et al.

Regarding claims 7 and 28, Soares discloses all of the limitations of these claims except for a teaching that the semiconductor fill comprises Indium Antimonide. However, Hines et al disclose extraordinary magnetoresistance sensors comprising a semiconductor material 12 disposed on a substrate 10 that is a high-mobility semiconductor and consists of indium antimonide (See Col. 4, lines 19 – 23 and 26 – 32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Soares according to the teachings of Hines et al for the purpose of, providing a semiconductor material having high carrier mobility and slow varying resistivity to drastically decrease mobility in doping (See Hines et al, Col. 4, lines 26 – 33).

Regarding claims 12, 17 and 29, Soares discloses all of the limitations of these claims except for a teaching that the film and metal contact are provided in a plate structure. However, in Hines et al, a semiconductor layer 51 and a metal shunt plate 52 form a plate structure (See Col. 9, lines 44 – 50, See Fig. 4E).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Soares according to the teachings of Hines et al for the purpose of, providing a simplified structure that has magnetotransport properties and that exhibits extraordinary magnetoresistance (See Hines et al, Col. 8, lines 24 – 31).

Regarding claim 25 and 32, Soares discloses all of the limitations of these claims except for a teaching that the semiconductor film comprises a mesa grown on the substrate. However, in Hines et al, mesas 12 are formed on the substrate 10 (See Fig. 1A, See Col. 5, lines 8 – 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Soares according to the teachings of Hines et al for the purpose of, patterning wafers into chips which include circular mesas to contribute to parallel conduction (See Hines et al, Col. 5, lines 1 – 16).

Regarding claims 26, 27 and 33, Soares discloses all of the limitations of these claims except for the plate having a filling factor of approximately 9/16. However, in Hines et al, a filling factor is calculated for the plate structure (See Cols. 10 and 11, lines 66 – 67 and 1 – 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Soares according to the teachings of Hines et al for the purpose of, calculating the EMR of the rectangular plate to obtain an effective and actual resistance (See Hines et al, Col. 10, lines 46 – 64).

Regarding claim 34 – 38, Soares discloses all of the limitations of these claims except for an inhomogeneous semiconductor film. However, in Hines et al, the semiconductor material 12 is inhomogeneous (See Cols. 4 and 5, lines 38 – 40 and 18 – 25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Soares according to the teachings of Hines et al for the purpose of, providing a cylinder of conducting material within a layer to enable good ohmic contact and to control the size of the final extraordinary magnetoresistance by controlling the geometric configuration and materials properties of both the semiconductor and the metallic inhomogeneities (See Hines et al, Col. 4, lines 41 – 56).

Response to Arguments

6. Applicant's arguments with respect to these claims have been considered but are moot in view of the new grounds of rejection.


7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

8. Any inquiry concerning this communication should be directed to examiner Octavia Davis at telephone number 571.272.2176.

If attempts to teach the examiner by telephone are unsuccessful, the examiners' supervisor Edward Lefkowitz, can be reached on 571.272.2180. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9306.


OD/2855

3/23/05


MAXNOORI
PRIMARY EXAMINER